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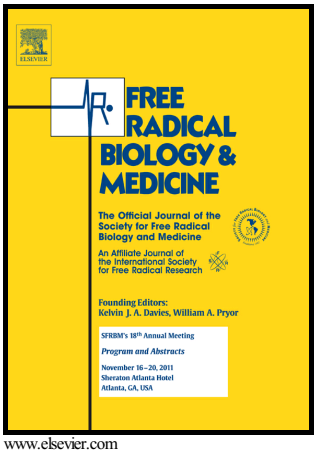

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Untimely Oxidative Stress in β-cells Leads to Diabetes Role of Circadian Clock in β-cell Function

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Abstract

Diabetes results from a loss of β-cell function. With the number of people with diabetes reaching epidemic proportions globally, understanding mechanisms that are contributing to this increasing prevalence is critical. One such factor has been circadian disruption, with shift-work, light pollution, jet-lag, increased screen time, all acting as potential contributory factors. Though circadian disruption has been epidemiologically associated with diabetes and other metabolic disorders for many decades, it is only recently that there has been a better understanding of the underlying molecular mechanisms. Experimental circadian disruption, via manipulation of environmental or genetic factors using gene-deletion mouse models, has demonstrated the importance of circadian rhythms in whole body metabolism. Genetic disruption of core clock genes, specifically in the β-cells in mice, have, now demonstrated the importance of the intrinsic β-cell clock in regulating function. Recent work has also shown the interaction of the circadian clock and enhancers in β-cells, indicating a highly integrated